

Heindel and Noyes

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- Consulting Hydrogeologists
- Engineers
- Environmental Scientists

802-658-0820

Fax 802-860-1014

October 29, 2003

Mr. Gerold Noyes
Waste Management Division
West Office Building
103 South Main Street
Waterbury, VT 05671-0404

Re: Quarterly Ground Water & Soil Pile Monitoring Report
Shelburne Corporation, Shelburne, Vermont (SMS Site # 2001-2861)

Dear Gerold:

Heindel & Noyes (H&N) present the results of the first round of quarterly ground water monitoring as concurred in the Sites Management Section's (SMS) letter of July 22, 2003. This activity represents the third round of water quality monitoring since the excavation project was completed in October 2002 and was performed on August 21, 2003. As requested by the SMS, a limited array of wells were sampled this round (MW-8, RW-2, RW-3, MW-101, MW-102 and MW-103). A Site Plan is provided in the Attachment, page 1.

GROUND WATER ELEVATIONS

Prior to sampling, all available monitoring wells were gauged to the nearest 0.01-foot using a water level indicator. Depth to water below Top of Casing (TOC) ranged from 0.82 feet (MW-102) to 6.51 feet (RW-2). Light non-aqueous phase liquid (LNAPL) was not present in any of the wells.

Depth to water data was subtracted from surveyed TOC elevations to determine water table elevations at each well. Refer to the Attachment, page 2, for a summary of these elevations. This data was used to construct ground water elevation contours, illustrated on the map in the Attachment, page 3. As indicated by the figure, ground water flow beneath the site is generally northerly with a lateral hydraulic gradient of 0.032 ft/ft (RW-3 to MW-4). An obvious ground water mound is apparent in the driveway where the bulk of the excavation was performed.

GROUND WATER SAMPLING

Prior to sampling, all available wells were purged of three well volumes or until dry to obtain representative ground water samples. Following well recovery, samples were collected with disposable bailers and deposited in two 40-mL vials preserved with Hydrochloric Acid (HCL). The samples were stored on ice and transported to Endyne, Inc., a certified environmental laboratory of Williston, Vermont, for analyses of Volatile Organic Compounds (VOCs) by EPA Method 8021B. Results of laboratory analyses

are tabulated in the Attachment, pages 4-6. The full laboratory report is also included in the Attachment, pages 7-9.

ANALYTICAL RESULTS

As indicated by the table, only wells RW-2 and RW-3 contained detectable concentrations of VOCs. However, these concentrations were very minor and only RW-2 contained concentrations that exceeded Vermont Ground Water Enforcement Standards (VGES). Here, the VGES for 1,2,4-Trimethylbenzene (5 ppb) was slightly exceeded (9.1 ppb).

Wells RW-2 and RW-3 were installed to monitor ground water quality immediately down gradient of the warehouse, where two small seeps of product were observed during excavation activities. Current data indicates that these seeps are not adversely affecting ground water quality at the site; however, continued monitoring should be employed to confirm this trend during seasonal fluctuations in ground water levels.

SOIL PILE MONITORING

H&N has visited the soil pile to monitor the system and field-screen the soil on a generally bi-weekly basis since the system was re-started on April 24, 2003. Monitoring includes taking measurements from the bioventing system of vacuum, flow, temperature and soil gas, including PID, CH₄, CO₂ and O₂. Tabulated results are presented in the Attachment, pages 10-11.

Bioventing, which is accomplished by use of the blower, has occurred in both vacuum and pressure phases to promote optimum airflow through the system. Vacuum/pressure readings hovered around 1 to 15 inches of water resulting in airflow rates of 10 to 80 cfm. Soil gas readings were relatively background for CH₄, slightly elevated for CO₂ and slightly deficient in O₂. PID values ranged from background (0 ppm) to 6 ppm, however recent readings (August to September) were less than 1 ppm.

These results indicate that biodegradation is active (based on CO₂/O₂ values), however physical recovery of hydrocarbons (PID) is minimal. This is further evidenced by soil screening results, which are tabulated in the Attachment, page 12. The table shows PID levels every foot from eight locations throughout the pile (SS-1 through SS-8). SS-8 was selected as a "hot spot" for screening every visit, while the rest are screened every third visit. A graph depicting PID results from each interval in SS-8 is provided in the Attachment, page 13. As the graph shows, elevated PID levels (>10 ppm) are consistently detected in the bottom four intervals (1-2, 2-3, 3-4, 4-5) while the top interval (0-1) has decreased to lower levels (<10 ppm).

Based on this data, an air test was conducted on the pile to determine if pneumatic influence is apparent throughout the pile. During the test, each monitoring point was temporarily disconnected from the system to measure vacuum/pressure values with all other points connected. This was performed in both vacuum and pressure phases of system operation. A tabulated summary of the results of the test is provided in the Attachment, pages 14-16.

Mr. Gerold Noyes
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As the table shows, total influence throughout the pile (although slight in some areas) was observed during the pressure phase only. The system is currently utilizing this configuration to promote optimal airflow in the pile. A general description of the test is provided in the memorandum in the Attachment, page 17.

CONCLUSIONS & RECOMMENDATIONS

Based on the results of the August 2003 monitoring event, H&N presents the following conclusions:

- Depth to water ranged from 0.82 to 6.51 feet below TOC resulting in a northerly flow path with a hydraulic gradient of 0.032 ft/ft.
- Minor concentrations of VOCs were detected in wells RW-2 and RW-3, only.
- The VGES for 1,2,4-Trimethylbenzene (5 ppb) was slightly exceeded (9.1 ppb) in RW-2 only.
- Soil screening continues to show elevated levels of petroleum contamination throughout the soil pile.

Based on these conclusions, H&N recommends continuing the current monitoring program on a quarterly basis to track contaminant concentrations at the site, most notably around RW-2. Recent data indicates that concentrations are decreasing; however, continued monitoring should be employed to confirm this trend during seasonal fluctuations in ground water levels.

H&N also recommends reworking the pile to stimulate physical recovery of hydrocarbons via increased airflow and further enhance biological recovery. To accomplish this, we will re-excavate the pile to add peat moss, which will act as a lightening agent and biologic enhancer. All system piping will be reinstalled to complete the bioventing component.

Please do not hesitate to call or email at eurch@q-city.com with any questions you may have.

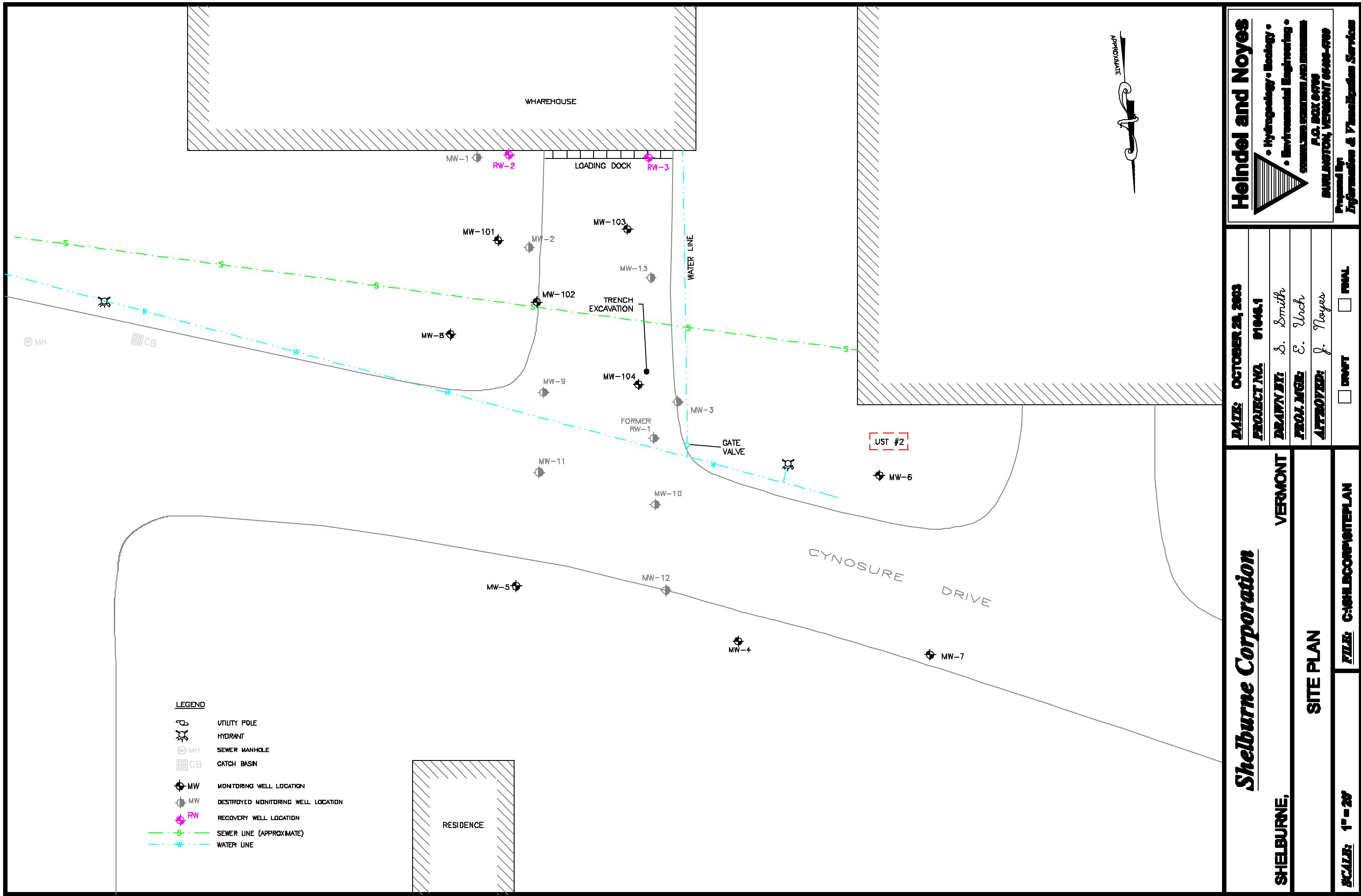
Sincerely,



Erik S. Urch
Project Manager

cc: Jack Danyow, Shelburne Corp.

ATTACHMENT



GROUNDWATER ELEVATION DATA (ft)
Shelburne Corporation
Shelburne, Vermont

DEPTH TO GROUNDWATER (ft)

Monitoring Well	Top of Casing Elevation	11/8/02	5/15/03	8/21/03
MW-1*				
MW-2*				
MW-3*				
MW-4	95.51	1.62	1.43	3.12
MW-5	96.55	3.02	2.83	dry
MW-6	97.45	1.33	0.96	2.22
MW-7	95.75	1.55	1.00	
MW-8	100.09	3.30	2.92	4.36
MW-9*				
MW-10*				
MW-11*				
MW-12*				
MW-13*				
RW-1*				
RW-2	102.53	5.66	5.49	6.51
RW-3	98.97	2.09	1.94	2.90
MW-101	97.96	1.23	0.85	2.16
MW-102	97.36	1.96	0.28	0.82
MW-103	98.02	2.08	0.93	1.85
MW-104	96.60	0.16	0.00	3.12

GROUNDWATER ELEVATION (ft)

Monitoring Well	Top of Casing Elevation	11/8/02	5/15/03	8/21/03
MW-1*				
MW-2*				
MW-3*				
MW-4	95.51	93.89	94.08	92.39
MW-5	96.55	93.53	93.72	dry
MW-6	97.45	96.12	96.49	95.23
MW-7	95.75	94.20	94.75	
MW-8	100.09	96.79	97.17	95.73
MW-9*				
MW-10*				
MW-11*				
MW-12*				
MW-13*				
RW-1*				
RW-2	102.53	96.87	97.04	96.02
RW-3	98.97	96.88	97.03	96.07
MW-101	97.96	96.73	97.11	95.80
MW-102	97.36	95.40	97.08	96.54
MW-103	98.02	95.94	97.09	96.17
MW-104	96.60	96.44	96.60	93.48

FP = free product

Black cells indicate no data available

*Wells destroyed during CAP excavation in October 2002.

Heindel and Noyes

• Hydrogeology • Ecology •
• Environmental Engineering •
P.O. Box 5476
BURLINGTON, VERMONT 05402-5476
Project #: Information & Visualization Services

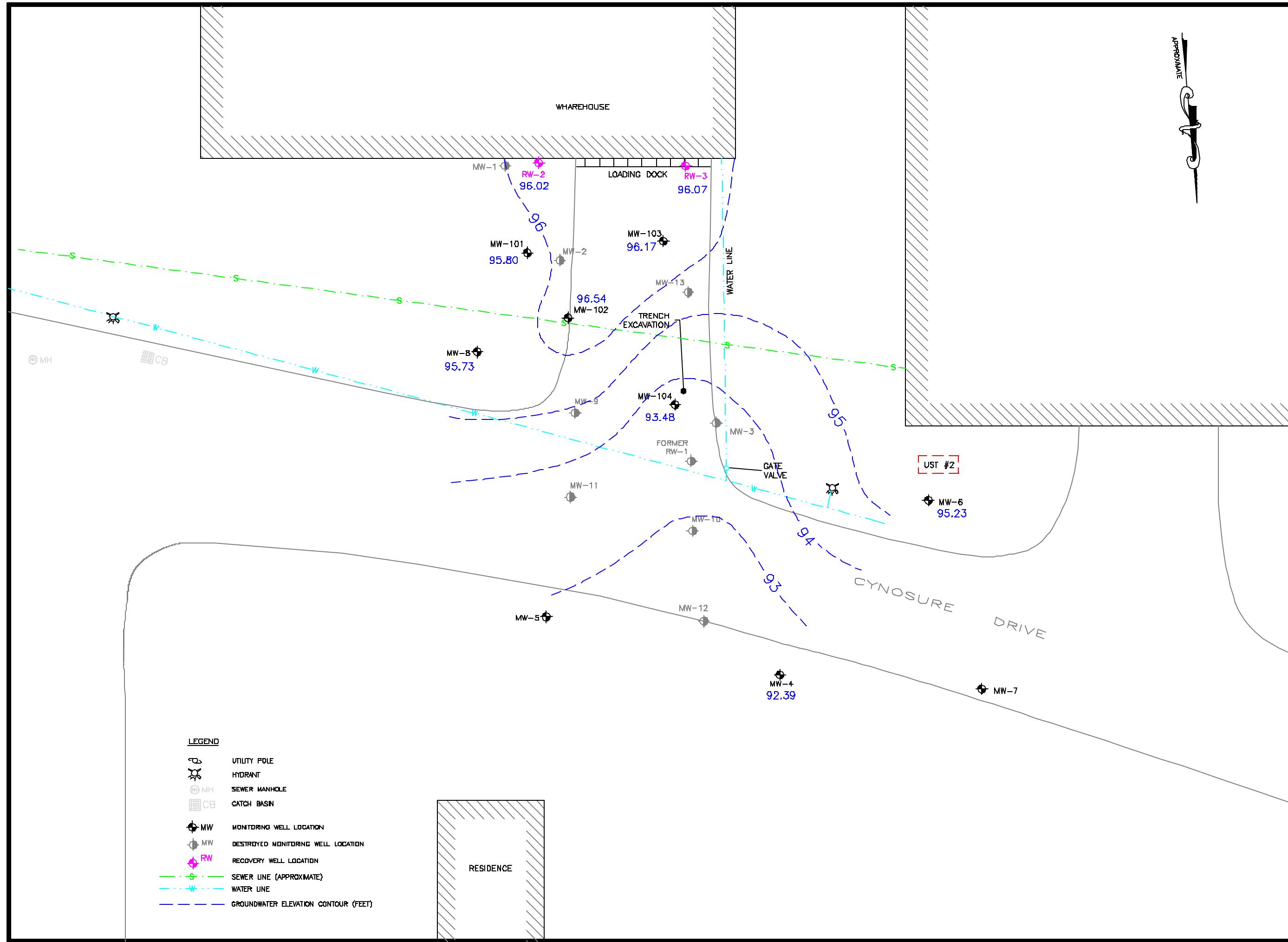
DATE: October 22, 2003 **PROJECT NO.:** NHEC.1
OWNER: J. Smith **FROM MGR:** E. Urch
ATTENDEE: J. Player **FINAL:**
DRAFT:

Shearburn Corporation

SHEARBURN,
VERMONT

GROUNDWATER ELEVATION CONTOUR MAP - 8/21/03

SCALE: 1" = 20'



GROUNDWATER QUALITY RESULTS
Shelburne Corporation
Shelburne, Vermont

Monitoring Well	Parameter	Units	VGES	5/4/01	7/20/01	9/20/01	2/21/02	11/8/02	5/15/03	8/21/03
MW-01	Benzene	ppb	5	209	35	1.3	ND / < 5			
	Toluene	ppb	1000	134	ND / < 1	ND / < 5				
	Ethylbenzene	ppb	700	44.9	ND / < 4	ND / < 1	ND / < 5			
	Xylene	ppb	10000	226	ND / < 1	ND / < 1	22.5			
	Total BTEX	ppb		613.9	< 41	< 4	< 38			
	MTBE	ppb	40	121	193	111	29.2			
	Naphthalene	ppb	20	65.3	ND / < 4	1.4	184			
	1,3,5-Trimethylbenzene	ppb	4	36.7	ND / < 4	ND / < 1	86.2			
	1,2,4-Trimethylbenzene	ppb	5	90.2	ND / < 4	ND / < 1	102			
	Unidentified Peaks	#		> 10	> 10	> 10	> 10			
MW-02	TPH -Diesel	ppm		1.48	1.36	ND / < 0.4				
	Benzene	ppb	5	ND / < 100	FP	FP	FP			
	Toluene	ppb	1000	ND / < 100	FP	FP	FP			
	Ethylbenzene	ppb	700	114	FP	FP	FP			
	Xylene	ppb	10000	523	FP	FP	FP			
	Total BTEX	ppb		< 837	FP	FP	FP			
	MTBE	ppb	40	ND / < 1000	FP	FP	FP			
	Naphthalene	ppb	20	1640	FP	FP	FP			
	1,3,5-Trimethylbenzene	ppb	4	702	FP	FP	FP			
	1,2,4-Trimethylbenzene	ppb	5	1190	FP	FP	FP			
MW-03	Unidentified Peaks	#		> 10	FP	FP	FP			
	TPH -Diesel	ppm		57.7	FP	FP	FP			
	Benzene	ppb	5	ND / < 1	ND / < 1					
	Toluene	ppb	1000	ND / < 1	7.2					
	Ethylbenzene	ppb	700	ND / < 1	ND / < 1					
	Xylene	ppb	10000	1.9	ND / < 1					
	Total BTEX	ppb		< 4.9	< 10.2					
	MTBE	ppb	40	ND / < 10	ND / < 10					
	Naphthalene	ppb	20	2.1	1.5					
	1,3,5-Trimethylbenzene	ppb	4	1.1	1.2					
MW-04	1,2,4-Trimethylbenzene	ppb	5	2.9	ND / < 1					
	Unidentified Peaks	#		> 10	0					
	TPH -Diesel	ppm		ND / < 0.4	ND / < 0.4					
	Benzene	ppb	5	ND / < 2	ND / < 1		ND / < 1	ND / < 1	ND / < 1	
	Toluene	ppb	1000	ND / < 2	ND / < 1		ND / < 1	1.4	ND / < 1	
	Ethylbenzene	ppb	700	ND / < 2	ND / < 1		ND / < 1	ND / < 1	ND / < 1	
	Xylene	ppb	10000	3.4	ND / < 1		ND / < 1	ND / < 2	ND / < 2	
	Total BTEX	ppb		< 9.4	< 4.0		< 4.0	< 5.4	< 5.0	
	MTBE	ppb	40	ND / < 20	ND / < 10		ND / < 5	ND / < 2	ND / < 2	
	Naphthalene	ppb	20	4.6	2		ND / < 1	1.5	1.4	
MW-05	1,3,5-Trimethylbenzene	ppb	4	22.2	8.1		ND / < 1	ND / < 1	ND / < 1	
	1,2,4-Trimethylbenzene	ppb	5	2.3	2.1		ND / < 1	ND / < 1	ND / < 1	
	Unidentified Peaks	#		> 10	> 10		0	> 10	> 10	
	TPH -Diesel	ppm		1.0	0.63					
	Benzene	ppb	5	ND / < 1			ND / < 1	ND / < 1	ND / < 1	
	Toluene	ppb	1000	ND / < 1			ND / < 1	ND / < 1	ND / < 1	
	Ethylbenzene	ppb	700	ND / < 1			ND / < 1	ND / < 1	ND / < 1	
	Xylene	ppb	10000	ND / < 1			ND / < 1	ND / < 2	ND / < 2	
	Total BTEX	ppb		< 4.0			< 4.0	< 5.0	< 5.0	
	MTBE	ppb	40	ND / < 10			ND / < 5	ND / < 2	9.6	
MW-06	Naphthalene	ppb	20	ND / < 1			ND / < 1	ND / < 1	ND / < 1	
	1,3,5-Trimethylbenzene	ppb	4	ND / < 1			ND / < 1	ND / < 1	ND / < 1	
	1,2,4-Trimethylbenzene	ppb	5	ND / < 1			ND / < 1	ND / < 1	ND / < 1	
	Unidentified Peaks	#		1			0	0	0	
	TPH -Diesel	ppm		ND / < 0.4						
	Benzene	ppb	5		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	Toluene	ppb	1000		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	Ethylbenzene	ppb	700		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	Xylene	ppb	10000		ND / < 1	ND / < 1	ND / < 1	ND / < 2	ND / < 2	
	Total BTEX	ppb		< 4.0	< 4.0	< 4.0	< 5.0	< 5.0	< 5.0	
MW-07	MTBE	ppb	40		ND / < 10	ND / < 10	ND / < 5	ND / < 2	ND / < 2	
	Naphthalene	ppb	20		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	1,3,5-Trimethylbenzene	ppb	4		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	1,2,4-Trimethylbenzene	ppb	5		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	Unidentified Peaks	#			2	> 10	2	2	0	
	TPH -Diesel	ppm			ND / < 0.4	ND / < 0.4				
	Benzene	ppb	5			ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	Toluene	ppb	1000			ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	Ethylbenzene	ppb	700			ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	Xylene	ppb	10000			ND / < 1	ND / < 1	ND / < 2	ND / < 2	
	Total BTEX	ppb			< 4.0	< 4.0	< 5.0	< 5.0	< 5.0	
	MTBE	ppb	40			ND / < 10	ND / < 5	ND / < 2	ND / < 2	
	Naphthalene	ppb	20			ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	1,3,5-Trimethylbenzene	ppb	4			ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	1,2,4-Trimethylbenzene	ppb	5			ND / < 1	ND / < 1	ND / < 1	ND / < 1	
	Unidentified Peaks	#				3	3	2	2	
	TPH -Diesel	ppm				ND / < 0.4				

Notes: ppb = Parts Per Billion (ug/L), ppm = Parts Per Million (mg/L), ND = Not Detected
 MTBE = Methyl-tert-butyl Ether, TPH = Total Petroleum Hydrocarbons
 FP = free product

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GROUNDWATER QUALITY RESULTS
Shelburne Corporation
Shelburne, Vermont

Monitoring Well	Parameter	Units	VGES	5/4/01	7/20/01	9/20/01	2/21/02	11/8/02	5/15/03	8/21/03
MW-08	Benzene	ppb	5		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1
	Toluene	ppb	1000		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1
	Ethylbenzene	ppb	700		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1
	Xylene	ppb	10000		ND / < 1	ND / < 1	ND / < 1	ND / < 2	ND / < 2	ND / < 2
	Total BTEX	ppb			< 4.0	< 4.0	< 4.0	< 5.0	< 5.0	ND / < 5
	MTBE	ppb	40		10.2	20.9	6.9	7.5	18	ND / < 2
	Naphthalene	ppb	20		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1
	1,3,5-Trimethylbenzene	ppb	4		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1
	1,2,4-Trimethylbenzene	ppb	5		ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1	ND / < 1
	Unidentified Peaks	#			2	0	3	0	0	0
MW-09	TPH -Diesel	ppm			ND / < 0.4	ND / < 0.4				
	Benzene	ppb	5			3.1				
	Toluene	ppb	1000			2.6				
	Ethylbenzene	ppb	700			10.4				
	Xylene	ppb	10000			79.6				
	Total BTEX	ppb				95.7				
	MTBE	ppb	40			148				
	Naphthalene	ppb	20			49.0				
	1,3,5-Trimethylbenzene	ppb	4			53.4				
	1,2,4-Trimethylbenzene	ppb	5			67.4				
MW-10	Unidentified Peaks	#				> 10				
	TPH -Diesel	ppm				1.9				
	Benzene	ppb	5			ND / < 1				
	Toluene	ppb	1000			ND / < 1				
	Ethylbenzene	ppb	700			ND / < 1				
	Xylene	ppb	10000			ND / < 1				
	Total BTEX	ppb				< 4.0				
	MTBE	ppb	40			ND / < 10				
	Naphthalene	ppb	20			ND / < 1				
	1,3,5-Trimethylbenzene	ppb	4			ND / < 1				
MW-11	1,2,4-Trimethylbenzene	ppb	5			ND / < 1				
	Unidentified Peaks	#				3				
	TPH -Diesel	ppm				ND / < 0.4				
	Benzene	ppb	5			ND / < 1				
	Toluene	ppb	1000			ND / < 1				
	Ethylbenzene	ppb	700			ND / < 1				
	Xylene	ppb	10000			ND / < 1				
	Total BTEX	ppb				< 4.0				
	MTBE	ppb	40			ND / < 10				
	Naphthalene	ppb	20			ND / < 1				
MW-12	1,3,5-Trimethylbenzene	ppb	4			ND / < 1				
	1,2,4-Trimethylbenzene	ppb	5			ND / < 1				
	Unidentified Peaks	#				2				
	TPH -Diesel	ppm				ND / < 0.4				
	Benzene	ppb	5			ND / < 1				
	Toluene	ppb	1000			ND / < 1				
	Ethylbenzene	ppb	700			ND / < 1				
	Xylene	ppb	10000			ND / < 1				
	Total BTEX	ppb				< 4.0				
	MTBE	ppb	40			ND / < 10				
MW-13	Naphthalene	ppb	20			ND / < 1				
	1,3,5-Trimethylbenzene	ppb	4			ND / < 1				
	1,2,4-Trimethylbenzene	ppb	5			ND / < 1				
	Unidentified Peaks	#				2				
	TPH -Diesel	ppm				ND / < 0.4				
	Benzene	ppb	5			FP	ND / < 5			
	Toluene	ppb	1000			FP	ND / < 5			
	Ethylbenzene	ppb	700			FP	5.8			
	Xylene	ppb	10000			FP	94.3			
	Total BTEX	ppb				FP	< 110.1			
RW-1	MTBE	ppb	40			FP	ND / < 25			
	Naphthalene	ppb	20			FP	49.3			
	1,3,5-Trimethylbenzene	ppb	4			FP	143			
	1,2,4-Trimethylbenzene	ppb	5			FP	66.9			
	Unidentified Peaks	#				FP	> 10			
	TPH -Diesel	ppm				FP				
	Benzene	ppb	5			10.5				
	Toluene	ppb	1000			25.9				
	Ethylbenzene	ppb	700			8.4				
	Xylene	ppb	10000			95.2				
	Total BTEX	ppb				140				
	MTBE	ppb	40			ND / < 10				
	Naphthalene	ppb	20			32.4				
	1,3,5-Trimethylbenzene	ppb	4			13.1				
	1,2,4-Trimethylbenzene	ppb	5			41.4				
	Unidentified Peaks	#				> 10				
	TPH -Diesel	ppm				0.72				

Notes: ppb = Parts Per Billion (ug/L), ppm = Parts Per Million (mg/L), ND = Not Detected
 MTBE = Methyl-tert-butyl Ether, TPH = Total Petroleum Hydrocarbons
 FP = free product

u:/projects/Shelburne Corp/Shelburne Corp/GW.xls

GROUNDWATER QUALITY RESULTS
Shelburne Corporation
Shelburne, Vermont

Monitoring Well	Parameter	Units	VGES	5/4/01	7/20/01	9/20/01	2/21/02	11/8/02	5/15/03	8/21/03
RW-2	Benzene	ppb	5				2.7	23.3	3.7	
	Toluene	ppb	1000				ND / < 1.0	ND / < 5.0	ND / < 1.0	
	Ethylbenzene	ppb	700				ND / < 1.0	14.6	2.3	
	Xylene	ppb	10000				7.4	12.2	2	
	Total BTEX	ppb					< 12.1	< 55.1	< 9.0	
	MTBE	ppb	40				4	ND / < 10.0	3.1	
	Naphthalene	ppb	20				6.5	29.7	7.9	
	1,3,5-Trimethylbenzene	ppb	4				3.2	7.8	1.0	
	1,2,4-Trimethylbenzene	ppb	5				7.2	53.9	9.1	
	Unidentified Peaks	#					> 10	> 10	> 10	
RW-3	TPH -Diesel	ppm								
	Benzene	ppb	5				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Toluene	ppb	1000				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Ethylbenzene	ppb	700				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Xylene	ppb	10000				ND / < 2.0	ND / < 2.0	ND / < 2.0	
	Total BTEX	ppb					ND / < 5.0	ND / < 5.0	ND / < 5.0	
	MTBE	ppb	40				ND / < 2.0	ND / < 2.0	ND / < 2.0	
	Naphthalene	ppb	20				ND / < 1.0	ND / < 1.0	3.7	
	1,3,5-Trimethylbenzene	ppb	4				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	1,2,4-Trimethylbenzene	ppb	5				ND / < 1.0	ND / < 1.0	2.3	
MW-101	Unidentified Peaks	#					0	0	3	
	TPH -Diesel	ppm								
	Benzene	ppb	5				ND / < 1.0	1.3	ND / < 1.0	
	Toluene	ppb	1000				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Ethylbenzene	ppb	700				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Xylene	ppb	10000				ND / < 2.0	ND / < 2.0	ND / < 2.0	
	Total BTEX	ppb					ND / < 5.0	ND / < 5.3	ND / < 5.0	
	MTBE	ppb	40				10.9	13.8	ND / < 2.0	
	Naphthalene	ppb	20				3.3	2.3	ND / < 1.0	
	1,3,5-Trimethylbenzene	ppb	4				3.7	ND / < 1.0	ND / < 1.0	
MW-102	1,2,4-Trimethylbenzene	ppb	5				7.9	ND / < 1.0	ND / < 1.0	
	Unidentified Peaks	#					> 10	> 10	> 10	
	TPH -Diesel	ppm								
	Benzene	ppb	5				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Toluene	ppb	1000				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Ethylbenzene	ppb	700				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Xylene	ppb	10000				ND / < 2.0	ND / < 2.0	ND / < 2.0	
	Total BTEX	ppb					ND / < 5.0	ND / < 5.0	ND / < 5.0	
	MTBE	ppb	40				41.4	2.3	ND / < 2.0	
	Naphthalene	ppb	20				ND / < 1.0	ND / < 1.0	ND / < 1.0	
MW-103	1,3,5-Trimethylbenzene	ppb	4				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	1,2,4-Trimethylbenzene	ppb	5				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Unidentified Peaks	#					0	0	0	
	TPH -Diesel	ppm								
	Benzene	ppb	5				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Toluene	ppb	1000				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Ethylbenzene	ppb	700				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Xylene	ppb	10000				ND / < 2.0	ND / < 2.0	ND / < 2.0	
	Total BTEX	ppb					ND / < 5.0	ND / < 5.0	ND / < 5.0	
	MTBE	ppb	40				5.4	ND / < 2.0	ND / < 2.0	
MW-104	Naphthalene	ppb	20				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	1,3,5-Trimethylbenzene	ppb	4				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	1,2,4-Trimethylbenzene	ppb	5				ND / < 1.0	ND / < 1.0	ND / < 1.0	
	Unidentified Peaks	#					0	0	0	
	TPH -Diesel	ppm								
	Benzene	ppb	5				ND / < 1.0	1.0		
	Toluene	ppb	1000				ND / < 1.0	3.9		
	Ethylbenzene	ppb	700				ND / < 1.0	ND / < 1.0		
	Xylene	ppb	10000				ND / < 2.0	ND / < 2.0		
	Total BTEX	ppb					ND / < 5.0	ND / < 7.9		
	MTBE	ppb	40				6.8	ND / < 2.0		
	Naphthalene	ppb	20				ND / < 1.0	ND / < 1.0		
	1,3,5-Trimethylbenzene	ppb	4				ND / < 1.0	ND / < 1.0		
	1,2,4-Trimethylbenzene	ppb	5				ND / < 1.0	ND / < 1.0		
	Unidentified Peaks	#					5	2		
	TPH -Diesel	ppm								

Notes: ppb = Parts Per Billion (ug/L), ppm = Parts Per Million (mg/L), ND = Not Detected
 MTBE = Methyl-tert-butyl Ether, TPH = Total Petroleum Hydrocarbons
 FP = free product

u:/projects/Shelburne Corp/ShelbCorpGW.xls



ENDYNE, INC.

LABORATORY REPORT

Laboratory Services

160 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

Heindel & Noyes
PO Box 64709,
Burlington, VT 05406-4709
Attn: Erik Urch

PROJECT: Shelburne Corp.
ORDER ID: 24579
RECEIVE DATE: August 21, 2003
REPORT DATE: September 4, 2003

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which include matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures





ENDYNE, INC.

Laboratory Services

160 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

CLIENT: Heindel & Noyes

ORDER ID: 24579

PROJECT: Shelburne Corp.

DATE RECEIVED: August 21, 2003

REPORT DATE: September 4, 2003

SAMPLER: NF/PD

Site: RW-2 Ref. Number: 215989 Anal. Method: SW 8021B Date Sampled: 8/21/03 Time Sampled: 10:40 AM Analysis Date: 9/1/03 Analyst: 420	Site: MW-101 Ref. Number: 215991 Anal. Method: SW 8021B Date Sampled: 8/21/03 Time Sampled: 11:00 AM Analysis Date: 9/1/03 Analyst: 420	Site: MW-8 Ref. Number: 215993 Anal. Method: SW 8021B Date Sampled: 8/21/03 Time Sampled: 10:50 AM Analysis Date: 8/29/03 Analyst: 420			
<u>Parameter</u>	<u>Results ug/L</u>	<u>Parameter</u>	<u>Results ug/L</u>	<u>Parameter</u>	<u>Results ug/L</u>
MTBE	3.1	MTBE	< 2.0	MTBE	< 2.0
Benzene	3.7	Benzene	< 1.0	Benzene	< 1.0
Toluene	< 1.0	Toluene	< 1.0	Toluene	< 1.0
Ethylbenzene	2.3	Ethylbenzene	< 1.0	Ethylbenzene	< 1.0
Xylenes, Total	< 2.0	Xylenes, Total	< 2.0	Xylenes, Total	< 2.0
1,3,5 Trimethyl Benzene	1.0	1,3,5 Trimethyl Benzene	< 1.0	1,3,5 Trimethyl Benzene	< 1.0
1,2,4 Trimethyl Benzene	9.1	1,2,4 Trimethyl Benzene	< 1.0	1,2,4 Trimethyl Benzene	< 1.0
Naphthalene	7.9	Naphthalene	< 1.0	Naphthalene	< 1.0
UIP's	> 10.	UIP's	> 10.	UIP's	0.
Surrogate 1	106.%	Surrogate 1	106.%	Surrogate 1	120.%
Site: RW-3 Ref. Number: 215990 Anal. Method: SW 8021B Date Sampled: 8/21/03 Time Sampled: 10:45 AM Analysis Date: 9/1/03 Analyst: 420	Site: MW-102 Ref. Number: 215992 Anal. Method: SW 8021B Date Sampled: 8/21/03 Time Sampled: 10:55 AM Analysis Date: 8/29/03 Analyst: 420	Site: MW-103 Ref. Number: 215994 Anal. Method: SW 8021B Date Sampled: 8/21/03 Time Sampled: 10:55 AM Analysis Date: 8/29/03 Analyst: 420			
<u>Parameter</u>	<u>Results ug/L</u>	<u>Parameter</u>	<u>Results ug/L</u>	<u>Parameter</u>	<u>Results ug/L</u>
MTBE	< 2.0	MTBE	< 2.0	MTBE	< 2.0
Benzene	< 1.0	Benzene	< 1.0	Benzene	< 1.0
Toluene	< 1.0	Toluene	< 1.0	Toluene	< 1.0
Ethylbenzene	< 1.0	Ethylbenzene	< 1.0	Ethylbenzene	< 1.0
Xylenes, Total	< 2.0	Xylenes, Total	< 2.0	Xylenes, Total	< 2.0
1,3,5 Trimethyl Benzene	< 1.0	1,3,5 Trimethyl Benzene	< 1.0	1,3,5 Trimethyl Benzene	< 1.0
1,2,4 Trimethyl Benzene	2.3	1,2,4 Trimethyl Benzene	< 1.0	1,2,4 Trimethyl Benzene	< 1.0
Naphthalene	3.7	Naphthalene	< 1.0	Naphthalene	< 1.0
UIP's	3.	UIP's	0.	UIP's	0.
Surrogate 1	112.%	Surrogate 1	109.%	Surrogate 1	114.%



SOIL GAS AND TEMPERATURE DATA
 Soil Treatment Center - Shelburne Corporation
 Shelburne, Vermont

Parameter	Location	Units	PRESSURE				VACUUM				PRESSURE		
			04/24/03	05/15/03	05/28/03	06/10/03	06/18/03	07/10/03	07/28/03	08/07/03	08/21/03	09/04/03	09/29/03
Temperature	Background	°F			64.0	63.1	70.0	70.2	80.0		75.0		52.0
	Trench Influent	°F	47.1		79.5	70.8	77.8	72.8	off		off	off	off
	Drain Influent	°F			78.0	65.6	76.0	72.8	off		off	off	off
	MP-1 (3)	°F	43.4		75.0	67.0	73.5	78.9	80.5		76.4	81.4	58.6
	MP-1 (5)	°F	45.0		75.1	67.8	73.7	78.9	78.4		76.2	81.4	60.6
	MP-2 (3)	°F	46.8		90.3	67.6	74.1	75.0	94.0		74.1	80.5	62.2
	MP-2 (5)	°F	44.5		88.5	67.2	74.2	75.3	90.3		74.8	80.2	62.4
	MP-3 (3)	°F	44.1		81.1	65.6	71.4	68.8	78.4		73.0	82.3	60.6
	MP-3 (5)	°F	41.5		83.1	65.2	71.2	69.7	79.5		74.1	82.3	59.5
	MP-4	°F							82.3		73.5	82.3	63.4
	MP-5	°F							81.1		75.1	79.8	65.2
	MP-6	°F							91.3		77.7	81.8	58.0
	MP-7	°F							91.5		77.9	81.4	58.4
	MP-8	°F							79.8		79.6	80.9	58.0
	MP Total Influent	°F									78.4	81.1	75.7
Methane	Background	%			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Trench Influent	%			0.05	0.05	0.05	0.05	off	off	off	off	off
	Drain Influent	%			0.05	0.05	0.05	0.05	off	off	off	off	off
	MP-1 (3)	%	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.10	0.05
	MP-1 (5)	%	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	MP-2 (3)	%	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	MP-2 (5)	%	0.10	0.05	0.05	0.05	0.10	0.05	0.09	0.05		water in line	water in line
	MP-3 (3)	%	0.05	0.05	0.05	0.14	0.10	0.05	0.09	0.05	0.05	0.19	0.05
	MP-3 (5)	%	0.05	0.05	0.19	0.14	0.19	0.27	0.10	0.05	0.05	0.35	0.05
	MP-4	%							0.10	0.14	0.05	0.31	0.05
	MP-5	%							0.05	0.05	0.05	0.05	0.05
	MP-6	%							0.05	0.05	0.05	0.05	0.05
	MP-7	%							0.27	0.05	0.05	0.05	0.05
	MP-8	%							0.22	0.05	0.05	0.05	0.05
	MP Total Influent	%								0.05	0.05	0.05	0.05
Carbon Dioxide (%)	Background	%			0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Trench Influent	%			0.05	0.05	0.05	0.26	off	off	off	off	off
	Drain Influent	%			0.05	0.05	0.05	0.26	off	off	off	off	off
	MP-1 (3)	%	0.78	0.05	0.58	0.86	0.74	0.62	0.72	0.06	0.06	0.14	0.14
	MP-1 (5)	%	0.10	0.78	0.10	0.10	0.10	0.10	0.12	0.06	0.18	0.22	0.14
	MP-2 (3)	%	0.10	0.10	0.70	1.26	1.66	1.86	0.38	0.30	0.16	0.14	0.10
	MP-2 (5)	%	0.10	0.05	0.26	1.26	1.38	1.38	1.08	0.10		water in line	water in line
	MP-3 (3)	%	0.13	0.05	0.62	2.90	1.02	1.94	2.83	5.26	4.33	0.73	0.13
	MP-3 (5)	%	0.22	0.05	0.86	1.70	0.98	1.90	0.34	0.18	0.18	0.26	0.14
	MP-4	%							1.42	0.86	0.91	0.91	0.05
	MP-5	%							0.47	0.26	0.26	0.26	0.14
	MP-6	%							0.30	0.10	0.05	0.10	0.20
	MP-7	%							0.50	0.10	0.10	0.10	0.10
	MP-8	%							0.34	0.10	0.05	0.10	0.14
	MP Total Influent	%								0.22	0.22	0.22	0.05
Oxygen (%)	Background	%			20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
	Trench Influent	%			20.9	20.9	20.9	20.6	off	off	off	off	off
	Drain Influent	%			20.9	20.9	20.9	20.7	off	off	off	off	off
	MP-1 (3)	%	19.0	20.9	20.3	19.3	20.0	20.2	20.3	20.8	20.9	20.8	20.8
	MP-1 (5)	%	20.8	19.8	20.9	20.8	20.9	20.9	20.9	20.9	20.8	20.7	20.8
	MP-2 (3)	%	20.8	20.9	20.2	19.6	19.3	19.0	20.6	20.6	20.8	20.8	20.8
	MP-2 (5)	%	20.8	20.9	20.7	20.0	19.8	19.8	19.2	20.8		water in line	water in line
	MP-3 (3)	%	20.7	20.9	20.4	17.0	20.0	19.0	17.4	14.1	15.6	20.2	20.8
	MP-3 (5)	%	20.8	20.9	20.0	18.8	20.2	19.4	20.6	20.7	20.8	20.7	20.7
	MP-4	%							20.0	19.8	19.9	20.0	20.9
	MP-5	%							20.6	20.7	20.7	20.7	20.8
	MP-6	%							20.6	20.8	20.9	20.8	20.7
	MP-7	%							20.6	20.8	20.9	20.9	20.8
	MP-8	%							20.8	20.8	20.9	20.9	20.9
	MP Total Influent	%								20.7	20.7	20.7	20.9
PID	Background	ppm			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	Trench Influent	ppm			0.0	0.0	0.0	0.4	off	off	off	off	off
	Drain Influent	ppm			0.1	0.0	0.0	0.5	off	off	off	off	off
	MP-1 (3)	ppm	3.4	0.0	1.4	1.0	0.4	1.0	1.0	0.2	0.0	0.1	0.2
	MP-1 (5)	ppm	0.6	2.9	0.2	0.4	0.4	1.1	0.4	0.1	0.2	0.1	0.1
	MP-2 (3)	ppm	0.8	0.4	2.9	6.2	2.4	4.0	0.2	0.1	0.0	0.2	0.2
	MP-2 (5)	ppm	1.8	0.1	1.0	5.1	2.2	4.6	0.4	0.4		water in line	water in line
	MP-3 (3)	ppm	1.6	0.2	1.0	2.6	1.0	1.0	0.4	0.1	0.0	0.3	0.2
	MP-3 (5)	ppm	5.8	0.1	2.0	3.4	1.4	2.6	1.5	0.1	0.0	0.1	0.4
	MP-4	ppm							8.2	0.1	0.0	0.1	0.1
	MP-5	ppm							3.5	0.2	0.0	0.1	0.2
	MP-6	ppm							1.0	0.2	0.1	0.1	0.1
	MP-7	ppm							0.6	0.1	0.0	0.1	0.4
	MP-8	ppm							0.3	0.2	0.0	0.1	0.2
	MP Total Influent	ppm								0.0	0.0	0.1	0.6
	Effluent	ppm							0.2	3.7	0.1	0.0	0.0

AIR FLOW DATA
Soil Treatment Center - Shelburne Corporation
Shelburne, Vermont

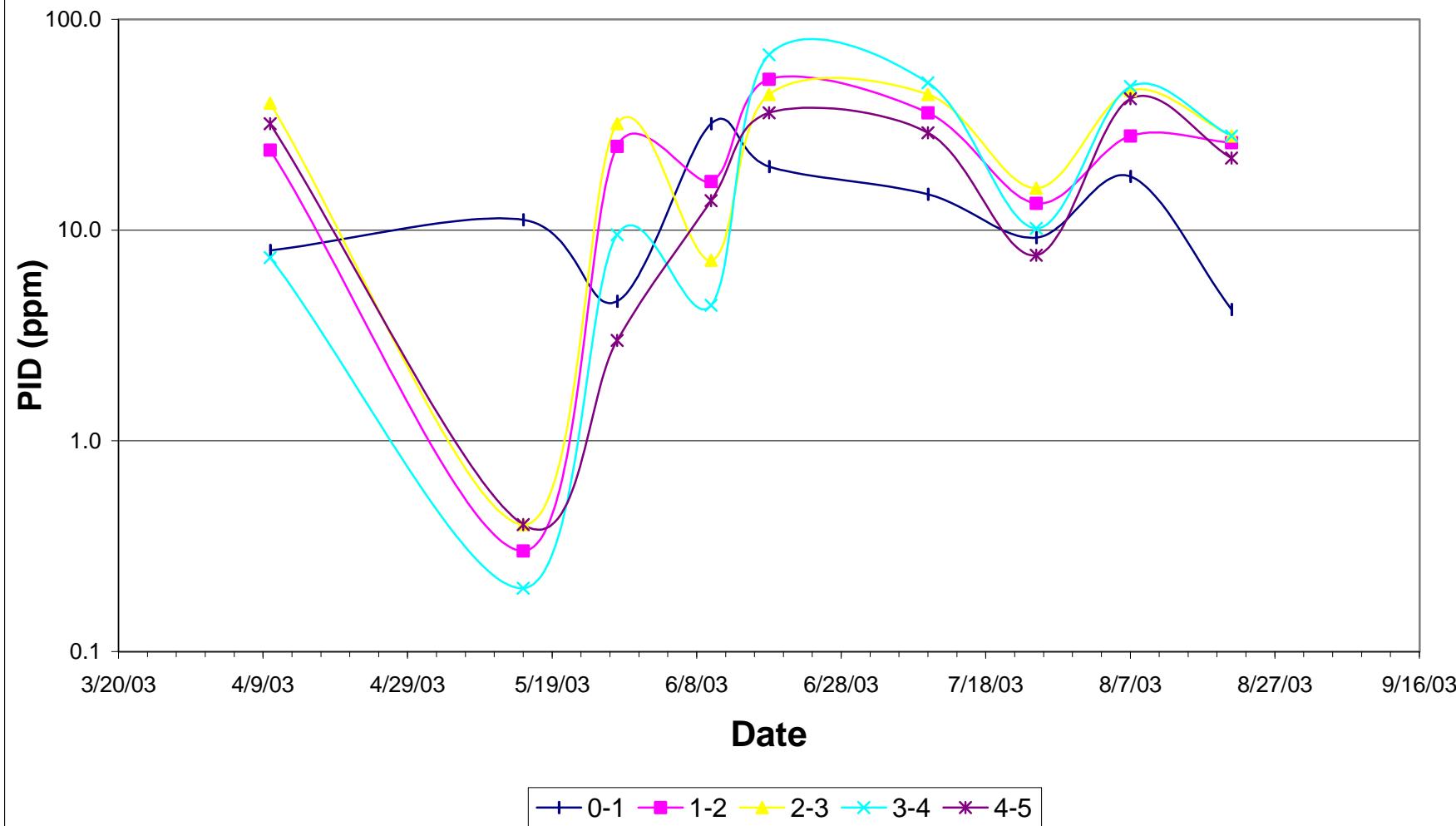
Parameter	Location	Units*	BLOWER REVERSED TO PRESSURE				BLOWER REVERSED TO VACUUM				BLOWER REVERSED TO PRESSURE					
			04/24/03	05/15/03	05/28/03	06/10/03		06/18/03	07/10/03	07/28/03	08/07/03	08/21/03	09/04/03		09/29/03	
Vacuum/Pressure	Trench Influent	in. of water			350.0	340.0		-320.0	-630.0	off	off	off	off		off	
	Drain Influent	in. of water			16.8	20.6		-22.6	-67.4	off	off	off	off		off	
	MP-1 (3)	in. of water	4.0	0.0	0.8	3.8		-1.2	0.4	-7.0	-9.0	-9.0	-10.0		8.0	
	MP-1 (5)	in. of water	5.8	0.0	0.0	3.6		-0.4	-0.1	0.0	0.0	-7.0	-9.0		8.0	
	MP-2 (3)	in. of water	2.9	0.0	2.2	3.5		-2.0	0.3	-9.0	-10.0	-10.0	-11.0		8.5	
	MP-2 (5)	in. of water	3.3	0.0	11.5	4.2		-2.5	14.2	-3.0	0.0	0.0	0.0		8.5	
	MP-3 (3)	in. of water	0.7	0.0	1.5	0.7		-0.3	0.2	-7.0	0.0	0.0	0.0		0.0	
	MP-3 (5)	in. of water	1.3	0.0	1.0	4.8		-3.7	-0.6	0.0	-13.0	-13.0	-13.0		11.0	
	MP-4	in. of water							-11.0	-13.0	-14.0	-13.0			11.0	
	MP-5	in. of water							-8.0	-9.0	-10.0	-10.0			8.0	
	MP-6	in. of water							-7.5	-9.0	-9.0	-10.0			8.0	
	MP-7	in. of water							-7.0	-8.5	-9.0	-10.0			7.0	
	MP-8	in. of water							-7.0	-8.5	-9.0	-10.0			7.5	
	MP Total Influent	in. of water									-15.0	-15.0			11.0	
Velocity	Trench Influent	ft/min	1847.0		2300.0	2450.0		2540.0	2050.0	off	off	off	off		off	
	Drain Influent	ft/min			1000.0	830.0		1010.0	1300.0	off	off	off	off		off	
	MP-1 (3)	ft/min							1875	1000	2500	1760			190	
	MP-1 (5)	ft/min							0.0	0.0		740.0			75.0	
	MP-2 (3)	ft/min							1100	1000	910	990			340	
	MP-2 (5)	ft/min							245	500		0			150	
	MP-3 (3)	ft/min							0.0	0.0		0.0			0.0	
	MP-3 (5)	ft/min							610	550	1120	1100			24	
	MP-4	ft/min							685	600	1135	1070			190	
	MP-5	ft/min							2350	1200	1235	2130			1300	
	MP-6	ft/min							540	700	875	830			37	
	MP-7	ft/min							575	500	875	770			690	
	MP-8	ft/min							615	500	800	890			630	
	MP Total Influent	ft/min									3600	3450			3600	
Flow	Trench Influent	cfm	40.3		50.1	53.4		55.4	44.7	off	off	off	off		off	
	Drain Influent	cfm			21.8	18.1		22.0	28.3	off	off	off	off		off	
	MP-1 (3)	cfm							40.9	21.8	54.5	38.4			4.1	
	MP-1 (5)	cfm							0.0	0.0						
	MP-2 (3)	cfm							24.0	21.8	19.8	21.6			7.4	
	MP-2 (5)	cfm							5.3	10.9						
	MP-3 (3)	cfm							0.0	0.0						
	MP-3 (5)	cfm							13.3	12.0	24.4	24.0			0.5	
	MP-4	cfm							14.9	13.1	24.7	23.3			4.1	
	MP-5	cfm							51.2	26.2	26.9	46.4			28.3	
	MP-6	cfm							11.8	15.3	19.1	18.1			0.8	
	MP-7	cfm							12.5	10.9	19.1	16.8			15.0	
	MP-8	cfm							13.4	10.9	17.4	19.4			13.7	
	MP Total Influent	cfm									78.5	75.2			78.5	

*From 4/24/03 to 7/10/03, pressure/vacuum measured in pascals.

SOIL SCREENING DATA
Shelburne Corporation
Shelburne, Vermont

Location	Depth (ft)	4/10/03	5/15/03	5/28/03	6/10/03	6/18/03	7/10/03	7/25/03	8/7/03	8/21/03	9/4/03	9/29/03
SS-1	0-1	9.8			10.2			16.2			3.0	
	1-2	19.0			22.0			15.4			13.2	
	2-3	13.2			26.0			3.6			9.4	
	3-4	--			11.4			7.4			12.2	
	4-5	19.6			6.2			3.8			14.6	
SS-2	0-1	5.8			42.0			3.4			11.6	
	1-2	14.8			62.0			7.8			28.0	
	2-3	17.0			68.0			2.0			16.8	
	3-4	17.2			52.0			5.0			52.0	
	4-5	11.4			46.0			7.2			40.0	
SS-3	0-1	1.2			18.8			3.0			4.0	
	1-2	5.8			22.0			5.8			10.2	
	2-3	2.4			28.0			9.2			9.8	
	3-4	13.2			36.0			22.0			13.6	
	4-5	4.2			36.0			30.0			8.4	
SS-4	0-1	0.8			2.4			1.0			5.0	
	1-2	1.2			2.3			1.2			32.0	
	2-3	7.8			5.2			2.0			28.0	
	3-4	12.2			4.8			6.6			30.0	
	4-5	4.0			9.8			7.4			15.6	
SS-5	0-1	1.2			7.2			1.4			12.0	
	1-2	1.2			13.0			2.0			8.6	
	2-3	3.4			11.5			2.0			15.4	
	3-4	2.6			7.3			4.2			22.0	
	4-5	4.8			10.4			8.8			16.8	
SS-6	0-1	12.4			19.4			7.0			5.6	
	1-2	10.2			28.0			3.4			34.0	
	2-3	4.2			30.0			12.6			48.0	
	3-4	6.0			20.0			13.8			32.0	
	4-5	13.2			22.0			15.8			24.0	
SS-7	0-1	8.4			25.0			13.2			16.2	
	1-2	9.2			32.0			5.6			15.0	
	2-3	9.4			42.0			10.2			28.0	
	3-4	13.6			12.2			32.0			28.0	
	4-5	5.8			8.7			26.0			17.2	
SS-8	0-1	8.0	11.2	4.6	32.0	20.0	14.8	9.2	18.0	4.2	12.4	24.0
	1-2	24.0	0.3	25.0	17.0	52.0	36.0	13.4	28.0	26.0	24.0	44.0
	2-3	40.0	0.4	32.0	7.2	44.0	44.0	15.8	46.0	28.0	10.6	40.0
	3-4	7.4	0.2	9.5	4.4	68.0	50.0	10.2	48.0	28.0	14.0	42.0
	4-5	32.0	0.4	3.0	13.8	36.0	29.0	7.6	42.0	22.0	16.2	26.0
Average PID:		10.2	2.5	14.8	21.9	44.0	34.8	9.4	36.4	21.6	18.9	35.2

SS-8 PID Concentrations



SOIL PILE AIR, GAS TEST
Shelburne Corp.

Note there are three components to the bioventing system:

1. VES (8 vertical vent points (MP-1 through MP-8) connected via manifold)
2. SUMP (gravel base of pile via 12" recovery sump)
3. TRENCH (gravel trench in middle of pile)

<u>VAC</u>	<u>In/Water</u>	<u>Pascals</u>	<u>PID</u>	<u>CH₄</u>	<u>CO₂</u>	<u>Flow</u>	<u>O₂</u>	<u>Temp</u>	<u>Notes</u>
Background	NA	NA	0.0	0.05	0.05	NA	20.9		

VACUUM, CONNECTED

Baseline Data - VES only under **VACUUM**, VES points CONNECTED (shaded)

<u>VAC</u>	<u>In/Water</u>	<u>Pascals</u>	<u>PID</u>	<u>CH₄</u>	<u>CO₂</u>	<u>Flow</u>	<u>O₂</u>	<u>Temp</u>	<u>Notes</u>
MP-1(3)	-8.00		0.1	0.05	0.10	1850	20.8	81.6	
MP-1(5)	-7.50		0.2	0.05	0.22	670	20.6	83.4	
MP-2(3)	-9.00		0.1	0.05	0.14	890	20.8	82.2	
MP-2(5)	-4.00		0.0	0.05	0.05	340	20.9	82.5	
MP-3(3)	0.00	1.0	0.9	0.05	1.46	0	19.1	82.7	
MP-3(5)	-11.50		0.3	0.05	0.16	920	20.7	83.2	
MP-4	-120.00		0.1	0.05	0.54	980	20.3	83.1	
MP-5	-8.50		0.1	0.05	0.22	2330	20.7	81.3	
MP-6	-8.00		0.1	0.10	0.10	700	20.8	81.8	
MP-7	-8.00		0.1	0.10	0.14	700	20.7	80.7	
MP-8	-8.00		0.3	0.05	0.05	650	20.8	80.2	
VP-1	-0.24	-60.0	3.8	0.05	0.34	0	20.5	83.1	
VP-2	0.00	19.0	10.2	0.38	0.87	0	18.8	82.7	
VES Influent	-13.50		0.3	0.10	0.14	3970	20.7	78.4	
SUMP Influent	0.00	1.5	0.1	0.05	0.22	0	20.7	81.3	
TRENCH Influent	0.00	-4.0	0.2	0.05	0.05	0	20.9	80.2	

VACUUM, DISCONNECTED

VES only under **VACUUM**, VES points DISCONNECTED

<u>VAC</u>	<u>In/Water</u>	<u>Pascals</u>	<u>PID</u>	<u>CH₄</u>	<u>CO₂</u>	<u>Flow</u>	<u>O₂</u>	<u>Temp</u>	<u>Notes</u>
MP-1(3)	-0.48		0.0	0.14	0.05	50	20.9		
MP-2(3)	0.00	-4.7	0.0	0.10	0.14	0	20.8		
MP-3(5)	0.00	12.2	3.6	0.10	0.46	0	20.7		
MP-4	0.00	-1.7	0.0	0.10	0.66	0	20.2		
MP-5	-0.30		0.0	0.10	0.18	25	20.8		
MP-6	-0.04	3.0	1.0	0.35	0.58	0	18.3		
MP-7	0.00	1.0	0.1	0.10	0.14	0	20.8		
MP-8	-0.12		0.1	0.10	0.05	0	20.9		water spilled out

SOIL PILE AIR, GAS TEST
Shelburne Corp.

VACUUM, DISCONNECTED

TRENCH only under **VACUUM**

VAC	In/Water	Pascals	PID	CH₄	CO₂	Flow	O₂	Temp	Notes
MP-1(3)	0.00	-1.0				0			
MP-1(5)	0.00	-1.0				0			
MP-2(3)	0.00	-0.6				0			
MP-2(5)	0.00	133.0				0			
MP-3(3)	0.00	3.9				0			
MP-3(5)	0.00	5.0				0			
MP-4	0.00	4.0				0		81.1	
MP-5	-0.02	0.1				0			
MP-6	0.00	-0.8				0			
MP-7	0.00	-0.6				0			
MP-8	0.00	0.8				0			
VP-1	0.00	-2.0				0			
VP-2	0.00	27.0				0			
VES Influent									
SUMP Influent	0.00	1.3				0		80.9	
TRENCH Influent	-3.50		0.0	0.05	0.18	4880	20.7	79.8	

VACUUM, DISCONNECTED

SUMP only under **VACUUM**

VAC	In/Water	Pascals	PID	CH₄	CO₂	Flow	O₂	Temp	Notes
MP-1(3)	0.00	0.3				0			
MP-1(5)	0.00	2.2				0			
MP-2(3)	0.00	0.9				0			
MP-2(5)	0.20	17.5				0			
MP-3(3)	0.00	1.7				0			
MP-3(5)	0.00	5.0				0			
MP-4	0.00	6.0				0			
MP-5	0.00	1.8				0			
MP-6	0.00	2.0				0			
MP-7	0.00	5.0				0			
MP-8	0.00	2.0				0			
VP-1	0.00	2.8				0			
VP-2	0.12	41.8				0			
Trench Inf	0.00	0.8				0			
Sump Inf	-3.00	---	0.0	0.05	0.34	4360	20.7	73.2	

SOIL PILE AIR, GAS TEST
Shelburne Corp.

PRESSURE, CONNECTED

VES only under **PRESSURE**, VES points CONNECTED (shaded)

VAC	In/Water	Pascals	PID	CH₄	CO₂	Flow	O₂	Temp	Notes
MP-1(3)	8.00					1240		80.9	
MP-1(5)	7.50					44			
MP-2(3)	8.50					470		81.6	
MP-2(5)	0.34	14.3				0			
MP-3(3)	0.00	-2.1				0			
MP-3(5)	11.00					22		81.1	
MP-4	11.50					42		82.3	
MP-5	8.00					1700		83.4	
MP-6	8.00					35		78.9	
MP-7	8.00					470		80.0	
MP-8	8.00					350		80.0	
VP-1	0.26	72.0				0			
VP-2	1.00	17.3				0			
VES Influent	11.50					3960		89.4	
SUMP Influent	0.00	0.6				0			
TRENCH Influent	0.02	4.8				0			

PRESSURE, DISCONNECTED

VES only under **PRESSURE**, VES points DISCONNECTED

VAC	In/Water	Pascals	PID	CH₄	CO₂	Flow	O₂	Temp	Notes
MP-1(3)	0.54	132.2	0.0	0.05	0.05	0	20.9		
MP-2(3)	0.04	3.1	0.0	0.05	0.05	0	20.9		
MP-3(5)	0.00	5.4	0.0	0.05	0.05	0	20.9		
MP-4	0.04	3.2	0.0	0.05	0.14	0	20.8		
MP-5	0.34	81.0	0.4	0.05	0.05	0	20.9		
MP-6	0.00	-2.9	1.6	0.10	1.46	0	18.2		
MP-7	0.06	4.1	0.2	0.05	0.06	0	20.9		
MP-8	0.16	39.8	0.2	0.05	0.10	0	20.8		

PRESSURE, DISCONNECTED

VES, SUMP, TRENCH under **PRESSURE**

VAC	In/Water	Pascals	PID	CH₄	CO₂	Flow	O₂	Temp	Notes
MP-1(3)	0.05	10.2				0			
MP-1(5)	0.06	9.1				0			
MP-2(3)	0.02	1.9				0			
MP-2(5)	0.01	-0.71				0			
MP-3(3)	0.04	2.9				0			
MP-3(5)	0.05	9.3				0			
MP-4	0.06	10.0				0			
MP-5	0.07	8.3				0			
MP-6	0.10	3.8				0			
MP-7	0.05	4.6				0			
MP-8	0.05	3.8				0			
VP-1	0.05	5.8				0			
VP-2	0.06	-2.2				0			

MEMORANDUM

DICTATED - NOT EDITED

TO: Shelburne Corp File
FR: Erik Urch
DT: September 16, 2003
RE: Air Test on Soil Pile
cc: Nate Freeman and Jeff Noyes

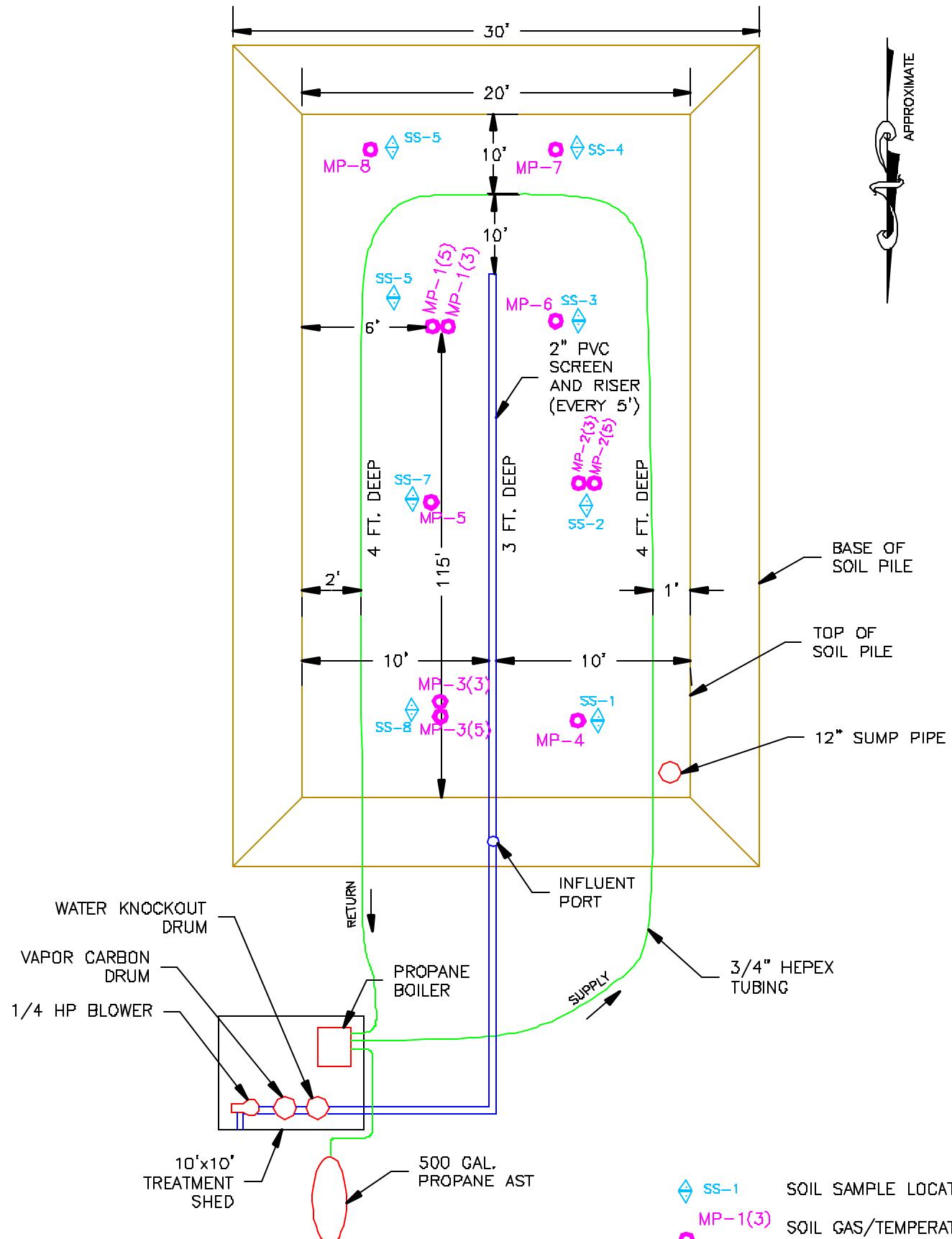
Nate and I performed an air test on the soil pile to try and figure out why the pile is not recovering hydrocarbons in the vapor phase via the VES system. Recent soil screening data shows that soils (glacial till) are still highly impacted throughout the pile both vertically and laterally. The soils are also moist throughout.

The system contains three components for aeration: VES (a series of vertical points), TRENCH (a single horizontal pipe) and SUMP (the sub-pile drainage area). Each component can be operated exclusively or in unison via the turn of a valve.

We acquired baseline data for the test which included vacuum, flow and soil gas readings from each point with the VES component on and under vacuum. For points connected to the VES, vacuum readings hovered around 8 to 12 inches of water resulting in flow rates in the 600 to 2000 fpm range. However, none of these points (connected to the VES) contained elevated soil gas readings, which indicates that short-circuiting may be occurring.

To test this theory, each point was individually disconnected from the VES and used as monitoring points. Very little vacuum was observed in only a couple of the points, which supports the theory of short-circuiting. In addition, positive pressure was observed in some points, which may be attributed to the Bernoulli effect (an increase in wind speed causes a temporary decrease in atmospheric pressure allowing air in the pile to escape). These results show that when the VES is under vacuum, very little influence is observed throughout the pile. The same results were observed when the TRENCH and SUMP components were running.

The blower was then reversed to blow air into the pile. The same tests were performed as above under this scenario. With the VES component running, all monitoring points but 2 showed slight positive pressure in the range of +0.04 to 0.54 inches of water. With all components running (VES, TRENCH, SUMP), all points showed positive pressure, however less in extent (+0.01 to 0.10). Although soil gas concentrations still hovered around background, the movement of air in the pile (as evidenced by the pressure readings in the monitoring points) may change the air chemistry in time. We will monitor the system in 10 days to evaluate this theory.



Shelburne Corporation

SHELBURNE,

VERMONT

SOIL PILE CONSTRUCTION PLAN

SCALE: NOT TO SCALE

FILE#: SHELBURNE_SOILPILE_CONSTRUCTION

DATE: AUGUST 22, 2000

PROJECT NO. 01042.1

DESIGN BY: S. Smith

PROJ. MGR.: E. Urch

APPROVED: J. Noyes

DRAFT

FINAL

Heindel and Noyes

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• Environmental Engineering •
• General Construction and Remediation
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